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Faculty of Sciences and Arts
Department of Applied Chemical Sciences
Chem. 103 First Exam
First Semester 2011/2012

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
B	C	C	B	A	A	B	B	D	D	B	A	D	B	C	B	C	C	D	B

B

Avogadro's number 6.02×10^{23}

Choose the most correct answer in the followings

Q.1 The agreement between the measured and the true value of an object is called:
(A) uncertainty (B) accuracy (C) precision (D) error

Q.2 According to the rules of significant figures, the result of the following operation $(6.167 + 83) \times 0.0252$ is:
(A) 2.24 (B) 2.242 (C) 2.2 (D) 2.26

Q.3 How many significant figures are there in the number 0.0005040 ?
(A) 2 (B) 3 (C) 4 (D) 5

Q.4 How many moles of Na are there in 4.92 grams of $Na_2Cr_2O_7$ (molar mass = 262 g/mol.)
(A) 0.0188 (B) 0. 0376 (C) 0.0751 (D) 0.0492

Q.5 The temperature - 40 ^{0}C (Celsius) equals ---------- ^{0}F (Fahrenheit):
(A) - 40 ^{0}F (B) - 32 ^{0}F (C) 24 ^{0}F (D) 62 ^{0}F

Q.6 How many grams of oxygen are needed to react completely with 0.010 moles of C_3H_8 according to the equation given below ? (molar mass in g/mol: H =1.0 ; O = 16)

$$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$$

(A) 1.6 grams (B) 8.0 grams (C) 64 grams (D) 0.80 grams

Q.7 There are ---------- picoseconds in 1000 seconds.
(A) 1×10^{-9} (B) 1×10^{15} (C) 1×10^{-15} (D) 1×10^{12}

Q.8 The density of a gas is 2.54 g/L. The volume of 0.132 grams of this gas in cm^3 is:
(A) 90.9 cm^3 (B) 52.0 cm^3 (C) 83.9 cm^3 (D) 48.4 cm^3

Q.9 How many atoms of oxygen are there in 1.33 grams of $Na_2Cr_2O_7$ (molar mass of $Na_2Cr_2O_7$ = 262 g/mol?
(A) 8.60×10^{22} (B) 4.21×10^{24} (C) 3.06×10^{21} (D) 2.14×10^{22}

Q.10 In the periodic table, the rows are called --------- and the columns are called ---------.
(A) rows, groups (B) staffs, families (C) groups, periods (D) periods, groups

Q.11 Consider the reaction: $Ca_3(PO_4)_2 + 3H_2SO_4 \rightarrow 3CaSO_4 + 2H_3PO_4$. The reaction was started by mixing 103 g of $Ca_3(PO_4)_2$ with 75.0 g of H_2SO_4 . How many grams of the product H_3PO_4 will be produced? (molar masses in g/mol: $Ca_3(PO_4)_2$ = 310.0 ; H_2SO_4 = 98.1 ; H_3PO_4 = 98.0)
(A) 74.9 g (B) 50.0 g (C) 112 g (D) 32.5 g

Q.12 What volume in mL of 18.0 M H_2SO_4 is needed to prepare 15.5 L 0f 0.195 M H_2SO_4?
(A) 168 mL (B) 336 mL (C) 226 mL (D) 92.3 mL

Q.13 Consider the following reaction: $S + 3F_2 \rightarrow SF_6$
When 1.75 grams of S were mixed with 1.75 grams of F_2 to give SF_6 according to the given equation: (molar masses g/mol: S = 32.1 ; F = 19.0 ; SF_6 = 146.1) the mass of the product SF_6 was 1.66 grams. The percent yield in this reaction is:
(A) 92.0% (B) 74.0% (C) 83.9% (D) 37.1%

Q.14 What volume in L of 0.145 M $Ca(OH)_2$ solution needed to completely neutralize 246 mL of 2.00 M HNO_3 solution?
(A) 1.33 L (B) 1.70 L (C) 0.850 L (D) 3.39 L

Q.15 The ions Mg^{2+} and PO_4^{3-} form a salt with the formula ----------.
(A) $MgPO_4$ (B) $Mg_2(PO_4)_3$ (C) $Mg_3(PO_4)_2$ (D) Mg_3PO_4

Q.16 Which solution should have the highest concentration of Cl^- ions?
(A) 0.20 M $CaCl_2$ (B) 0.15 M $AlCl_3$ (C) 0.25 M NaCl (D) 0.15 M HCl

Q.17 The element sulfur (S) has an atomic number of 16 and a mass number of 32 . The ion S^{2-} should contain -------- protons (p) , -------- neutrons (n) and ---------- electrons (e) respectively:
(A) 16 p , 16 n, 16e (B) 18 p , 16 n, 16e (C) 16 p , 16 n, 18e (D) 16 p , 18 n, 16e

Q.18 The volume of a 0.040 M $CaCl_2$ solution needed to precipitate (الترسيب) all the Ag^+ from an 80.0 mL of 0.224 M solution of $AgNO_3$. $2AgNO_{3\,(aq)} + CaCl_{2\,(aq)} \rightarrow 2AgCl_{(s)}\downarrow + Ca(NO_3)_{2\,(aq)}$
(A) 112 mL (B) 366 mL (C) 224 mL (D) 448 mL

Q.19. What is the molarity of a solution made by mixing 200mL of 0.0220 M NaOH solution with 300 mL of 0.0440 NaOH solution?

(A) 0.0167 M (B) 0.0330 M (C) 0.0660 M (D) 0.0352 M

Q.20 Consider the reaction: A → B . When 3.65 g of B were actually collected the percent yield for this reaction was calculated and found 70.0%. What is the theoretical yield of this reaction?
(A) 2.56 g (B) 5.21 g (C) 6.23 g (D) 2.61 g